



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/577,127	04/25/2006	Satoshi Seo	0756-7662	8187

31780 7590 11/12/2008
ERIC ROBINSON
PMB 955
21010 SOUTHBANK ST.
POTOMAC FALLS, VA 20165

EXAMINER

PATTON, PAUL E

ART UNIT	PAPER NUMBER
----------	--------------

2822

MAIL DATE	DELIVERY MODE
-----------	---------------

11/12/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/577,127	Applicant(s) SEO ET AL.	
	Examiner PAUL E. PATTON	Art Unit 2822	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 September 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 and 19-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 6,7,12,8/6 and 15/12 is/are allowed.
- 6) ☒ Claim(s) 1-5,8/1,8/2,9-11,14, 15/9, 15/10,and 16-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>9/19/2008</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. Applicant's arguments with respect to claims 1-22 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

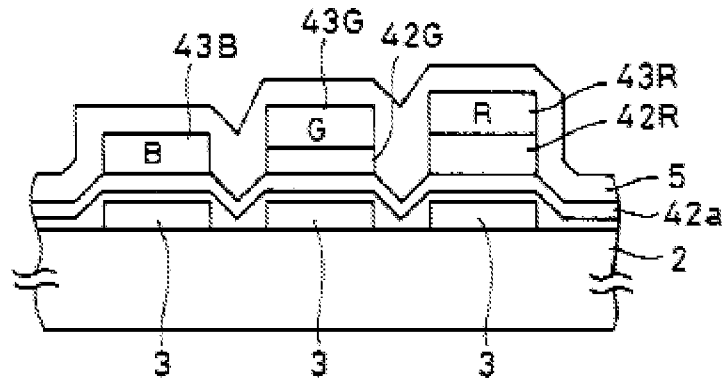
(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 2, and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fukuda (USPAT 6,541,130 B2) in view of Uchida (USPAT 7,122,845 B2) and further in view of Kido et al. (USPAT 6,589,673 B1) hereinafter Kido.
4. Fukuda discloses and shows and shows (Fig 3) a light-emitting device having at least first and second light emitting elements exhibiting different emission colors., each of the first and second light-emitting elements comprising: a first electrode and a second electrode where the electrodes are in contact with the respective first and third layers; and a first layer, a second layer and a third layer which are formed over the first electrode and a second electrode over the first layer, the second layer and the third layer, wherein the first layer serves as a layer generating holes, the second layer serves as a layer including a light-emitting layer, and the third layer serves as a layer generating electrons, and wherein a thickness of the first layer of the first light-emitting element is different from that of the second light-emitting element and the first and

Art Unit: 2822

second thickness are different from the third light-emitting element. (Column 5, lines 24-36 & Column 9, line 62-column 11 line 59).

FIG. 3



5. Fukuda does not explicitly disclose that the first electrode has a non-light-transmitting property in that the disclosed device is a "bottom emission" device wherein the substrate is transparent and the upper electrode is reflective. However, it is well known in the art that a top emission device can be formed by reversing the two electrodes such that the top electrode is transparent and the bottom electrode is reflective as demonstrated below.

6. Uchida is related to a similar device and discloses and shows (Fig 1 and 4) both a top emitting and bottom emitting configuration of the device and shows that the top emitting device employs a transparent ITO electrode on the top side and a reflective substrate on the bottom. (See entire patent and especially column 6, line 60 – column 7 line 25).

7. Uchida is evidence that a person of ordinary skill in the art would find a reason, suggestion or motivation to form a top emitting device.

Art Unit: 2822

8. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Fukuda by forming a top emitting device by transposing the electrodes for advantages such as increasing the opening ratios of the pixels according to the teachings of Uchida. (Column 7, lines 54-58).

9. Fukuda as modified by Uchida does not explicitly disclose that the first layers comprise an organic compound and a metal oxide.

10. Kido discloses doping the organic layer with a metal oxide. (Column 3, line 66 – column 4, line 67).

11. Kido is evidence that a person of ordinary skill in the art would find a reason, suggestion or motivation to use a metal oxide mixed with the organic layer.

12. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Fukuda and Miura by using a metal oxide mixed with the organic layer for advantages such as operating at a lower driving voltage according to the teachings of Kido. (Column 3, lines 1-5).

13. Claim 4 is rejected under 35 U.S.C 103(a) as being unpatentable over Fukuda as modified by Uchida and further in view of Mori et al., (US 2005/0249974 A1) hereinafter Mori.

14. Fukuda as modified by Uchida does not disclose that the metal oxide is selected from the group consisting of molybdenum oxide, vanadium oxide and rhenium oxide.

15. Mori discloses that the hole generating layer can comprise one of molybdenum oxide, vanadium oxide and rhenium oxide. (Paragraph [0150]).

Art Unit: 2822

16. Mori is evidence that a person of ordinary skill in the art would find a reason, suggestion or motivation to use a hole generating layer can comprise one of molybdenum oxide, vanadium oxide and rhenium oxide.

17. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Fukuda and Uchida by using a hole generating layer comprising one of molybdenum oxide, vanadium oxide and rhenium oxide for advantages such as stabilizing charge injection and enhancing light emitting efficiency according to the teachings of Mori.

18. Claim 5 is rejected under 35 U.S.C 103(a) as being unpatentable over Fukuda as modified by Uchida and Kido.

19. Fukuda as modified by Uchida and Kido discloses a representative list of organic substances concurrent with those claimed. (Kido, Column 8, line 35 – column 10, line 65).

20. Claims 8/1 and 8.2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fukuda as modified by Uchida and Kido, and further in view of Arai (USPAT 6,111,274).

21. Fukuda as modified by Uchida and Kido does not disclose that the second electrode comprises indium tin oxide (ITO) including silicon oxide.

22. Arai discloses that the electrode comprising ITO also includes silicon oxide. (Column 4, lines 54-59).

23. Arai is evidence that a person of ordinary skill in the art would find a reason, suggestion or motivation to use ITO including silicon oxide.

Art Unit: 2822

24. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Fukuda, Kido, Matsumoto, Urabe and Utsugi by using ITO including silicon oxide for advantages such as adjusting the work function of the electrode according to the teachings of Arai. (Column 4, lines 55-56).

25. Claim 8/6 is dependent on an allowed claim and is therefore allowed.

26. Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fukuda in view of Uchida and Kido.

27. Fukuda as modified by Uchida and Kido discloses a light-emitting device comprising: a plurality of transistors provided at interconnection portions formed by signal lines and scanning lines; a plurality of first electrodes that are connected to the plurality of transistors and each has a non-light-transmitting property; a plurality of first layers serving as layers generating holes over and in contact with the plurality of first electrodes, respectively; a plurality of second layers serving as layers including at least one of light-emitting layers emitting first to third light over the plurality of first layers; a plurality of third layers serving as layers generating electrons over the plurality of second layers; and a second electrode that has a light transmitting property over the plurality of first layers, the plurality of second layers and the plurality of third layers, wherein the plurality of first layers are each a layer in which an organic compound and a metal oxide are mixed, and wherein thicknesses of the plurality of first layers are different depending on each light-emitting element emitting the first to third light. (For the transistors, and interconnections see Uchida Fig 5).

Art Unit: 2822

28. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fukuda in view of Uchida, Kido and Mori.

29. Fukuda as modified by Uchida, Kido and Mori discloses the metal oxide is selected from the group consisting of molybdenum oxide, vanadium oxide and rhenium oxide.

30. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fukuda as modified by Uchida and Kido.

31. Fukuda as modified by Uchida and Kido discloses a representative list of organic substances concurrent with those claimed. (Kido, Column 8, line 35 – column 10, line 65).

32. Claims 15/9 and 15/10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fukuda as modified by Uchida, Kido and Arai.

33. Claim 15/12 depends on an allowed independent claim and is thus allowed.

34. Fukuda as modified by Uchida Kido and Arai discloses the second electrode comprises indium tin oxide including silicon oxide.

35. Claims 16, 17, 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fukuda as modified by Uchida and Kido and further in view of Urabe et al. (USPAT 6,969,948 B2) hereinafter Urabe.

36. Fukuda as modified by Uchida and Kido, Miura discloses all the limitations of claims 16, 17, 19 and 20 except for the addition of a plurality of color filters having different optical characteristics which are formed on the first electrode side or emission side.

Art Unit: 2822

37. Urabe is related to a similar organic light emitting display device and discloses and shows (Fig 1) three color light emitting devices (10R, 10G, 10B) with corresponding color filters (22R, 22G, 22B) on the emission side.

38. Urabe is evidence that a person of ordinary skill in the art would find a reason, suggestion or motivation to use a plurality of color filters having different optical characteristics which are formed on the first electrode side or emission side.

39. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Fukuda, Miura, Kido and Utsugi by using a plurality of color filters having different optical characteristics which are formed on the first electrode side or emission side for advantages such as increasing contrast according to the teachings of Urabe. (Column 3, lines 12-19).

40. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fukuda in view of Uchida, Kido, Urabe and Mori.

41. Fukuda as modified by Uchida, Kido and Mori discloses the metal oxide is selected from the group consisting of molybdenum oxide, vanadium oxide and rhenium oxide.

42. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fukuda as modified by Uchida, Kido and Arai.

43. Fukuda as modified by Uchida Kido, Urabe and Arai discloses the second electrode comprises indium tin oxide including silicon oxide.

Allowable Subject Matter

44. Claims 6, 7 and 12 are allowed along with dependent claims 8/6, 13 and 15/12.

Art Unit: 2822

45. The prior art of record taken alone or in combination fails to anticipate or render obvious a fourth layer serving as a layer generating hole over the third layer along with all the other limitations of claims 6, 7 and 12.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PAUL E. PATTON whose telephone number is (571)272-9762. The examiner can normally be reached on 7:00 - 5:30 Monday through Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Zandra Smith can be reached on 571-272-2429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Zandra V. Smith/
Supervisory Patent Examiner, Art Unit 2822

Paul E Patton
Examiner
Art Unit 2822

/P. E. P./

Application/Control Number: 10/577,127

Page 10

Art Unit: 2822

Examiner, Art Unit 2822

46.